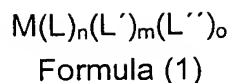
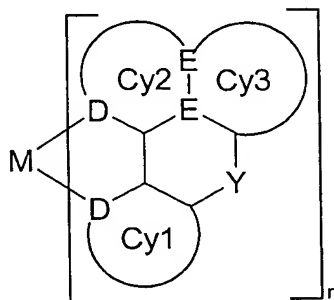


What is claimed is:

1. A compound of the formula (1)



containing a part-structure  $M(L)_n$  of the formula (2)



Formula (2)

where the symbols and indices used are:

M at each instance is a transition metal ion;

Y is the same or different at each instance and is  $BR^1$ ,  $CR_2$ ,  $C=O$ ,  $C=NR^1$ ,  $C=CR_2$ ,  $SiR^1_2$ ,  $NR^1$ ,  $PR^1$ ,  $AsR^1$ ,  $SbR^1$ ,  $BiR^1$ ,  $P(O)R^1$ ,  $P(S)R^1$ ,  $P(Se)R^1$ ,  $As(O)R^1$ ,  $As(S)R^1$ ,  $As(Se)R^1$ ,  $Sb(O)R^1$ ,  $Sb(S)R^1$ ,  $Sb(Se)R^1$ ,  $Bi(O)R^1$ ,  $Bi(S)R^1$ ,  $Bi(Se)R^1$ , O, S, Se, Te, SO, SeO, TeO, SO<sub>2</sub>, SeO<sub>2</sub>, TeO<sub>2</sub> or a single bond;

D is the same or different at each instance and is a carbon atom or a heteroatom with a nonbonding electron pair which coordinates to the metal, with the proviso that one D per ligand is a carbon atom and the other is a heteroatom with a nonbonding electron pair;

E is the same or different at each instance and is C or N, with the proviso that at least one symbol E is C;

Cy1 is the same or different at each instance and is a saturated, unsaturated or aromatic homo- or heterocycle which is bonded to the metal M via an atom D and which also has a single bond to the part-cycle Cy2 and a single bond to the Y group;

Cy2 is the same or different at each instance and is a saturated, unsaturated or aromatic part-homo- or -heterocycle which is bonded via an atom D to the metal M and which also has a single bond to the cycle Cy1 and a common edge with the part-cycle Cy3;

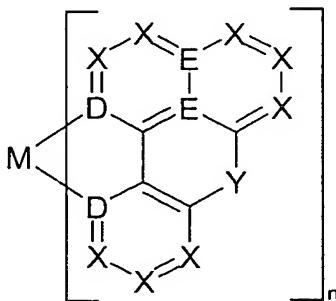
Cy3 is the same or different at each instance and is a saturated, unsaturated or aromatic part-homo- or -heterocycle which has a single bond to the Y group and a common edge with the part-cycle Cy2;

R<sup>1</sup> is the same or different at each instance and is H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms;

n is 1, 2 or 3;

the ligands L' and L'' in formula (1) are monoanionic, bidentate chelating ligands, and m and o are the same or different at each instance and are 0, 1 or 2.

2. A compound as claimed in claim 1, comprising a part-structure of the formula (2a)



Formula (2a)

where Y, R<sup>1</sup>, L', L'' and n are each defined as described in claim 1, and the further symbols are:

M is Mo, W, Re, Ru, Os, Rh, Ir, Pd, Pt or Au;

D is the same or different at each instance and is a carbon atom, a nitrogen atom or a phosphorus atom, with the proviso that one D is a carbon atom and the other D is a nitrogen atom or a phosphorus atom;

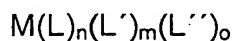
X is the same or different at each instance and is CR, N or P; or one or more X-X units are NR, S or O; or one X-X unit in the fused part-cycles Cy2 and Cy3 is CR, N or P if one of the symbols E is N;

E is the same or different at each instance and is C or N, with the proviso that at least one symbol E is C and also with the proviso that precisely one X-X unit in the fused part-cycles Cy2 and Cy3 is CR, N or P if one symbol E is N;

R is the same or different at each instance and is H, F, Cl, Br, I, OH, NO<sub>2</sub>, CN, a straight-chain, branched or cyclic alkyl or alkoxy group having from 1 to 20 carbon atoms, where one or more nonadjacent CH<sub>2</sub> groups may be replaced by -R<sup>1</sup>C=CR<sup>1</sup>-, -C≡C-, Si(R<sup>1</sup>)<sub>2</sub>, Ge(R<sup>1</sup>)<sub>2</sub>, Sn(R<sup>1</sup>)<sub>2</sub>, -O-, -S-, -NR<sup>1</sup>-, -(C=O)-, -(C=NR<sup>1</sup>)-, -P=O(R<sup>1</sup>)- or -CONR<sup>1</sup>- and where one or more hydrogen atoms may be replaced by F, or an aryl, heteroaryl, aryloxy or heteroaryloxy group which has from 1 to 14 carbon atoms and may be substituted by one or more nonaromatic R radicals, where a plurality of substituents R, both on the

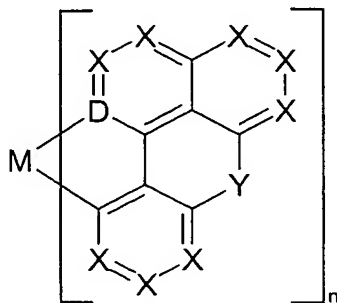
same ring and on different rings, may in turn form a further mono- or polycyclic, aliphatic or aromatic ring system.

3. A compound of the formula (1a) as claimed in claim 2



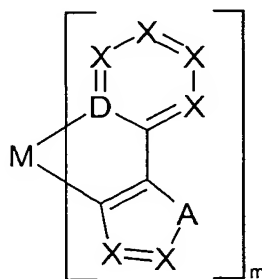
Formula (1a)

containing at least one part-structure  $M(L)_n$  of the formula (2b), identically or differently at each instance,



Formula (2b)

and optionally containing a part-structure  $M(L')_m$  of the formula (3), identically or differently at each instance



Formula (3)

where M, X, Y, R, R<sup>1</sup>, L<sup>1</sup>, n, m and o are each defined as described in claim 1 and 2, and the further symbols and indices are each defined as follows:

D is the same or different at each instance and is N or P;

A is the same or different at each instance and is -CR=CR-, -N=CR-, -P=CR-, -N=N-, -P=N-, NR, PR, O, S, Se.

4. A compound as claimed in one or more of claims 1 to 3, characterized in that the symbols M = Rh, Ir, Pd or Pt.

5. A compound as claimed in one or more of claims 1 to 4, characterized in that the symbol  $n = 2$  or 3.

6. A compound as claimed in one or more of claims 3 to 5, characterized in that the symbol  $D = N$ .

7. A compound as claimed in one or more of claims 1 to 6, characterized in that the symbol  $X = CR$ .

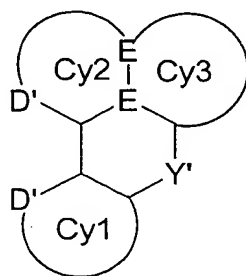
8. A compound as claimed in one or more of claims 1 to 7, characterized in that the symbol  $Y = CR_2, C=O, C=CR_2, NR^1, PR^1, P(O)R^1, O, S, SO, SO_2$  or a single bond.

9. A compound as claimed in one or more of claims 1 to 8, characterized in that R is:

R is the same or different at each instance and is H, F, a straight-chain, branched or cyclic alkyl or alkoxy group having from 1 to 4 carbon atoms, where one or more hydrogen atoms may be replaced by F, or an aryl or heteroaryl group which has from 1 to 6 carbon atoms and may be substituted by one or more nonaromatic R radicals, where a plurality of substituents R, both on the same ring and on different rings, together may in turn form a further aliphatic or aromatic, mono- or polycyclic ring system.

10. A compound as claimed in one or more of claims 1 to 9, characterized in that Y is a spiro carbon atom.

11. A compound of the formula (4)



Formula (4)

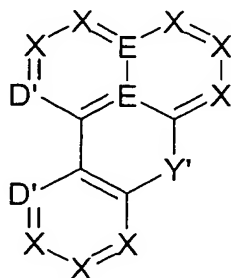
where the symbols E, Cy1, Cy2 and Cy3 are each defined as described in claim 1, and the further symbols are:

$Y'$  is the same or different at each instance and is  $BR^1, CR_2, C=NR^1, C=CR_2, SiR^1_2, PR^1, AsR^1, SbR^1, BiR^1, P(O)R^1, P(S)R^1, P(Se)R^1, As(O)R^1, As(S)R^1,$

As(Se)R<sup>1</sup>, Sb(O)R<sup>1</sup>, Sb(S)R<sup>1</sup>, Sb(Se)R<sup>1</sup>, Bi(O)R<sup>1</sup>, Bi(S)R<sup>1</sup>, Bi(Se)R<sup>1</sup>, Se, SO, SeO, TeO, SO<sub>2</sub>, SeO<sub>2</sub>, TeO<sub>2</sub>;

D' is the same or different at each instance and is C-H, N or P, with the proviso that one symbol D' is C-H and the other symbol D' is N or P.

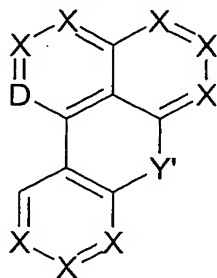
12. A compound of the formula (4a) as claimed in claim 11



Formula (4a)

where the symbols are each as defined in claim 1, 2 and 11.

13. A compound of the formula (4b) as claimed in claim 12



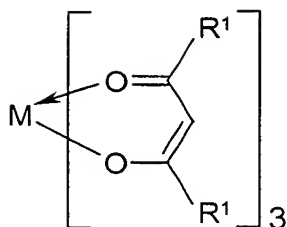
Formula (4b)

where D is N or P and the further symbols are each defined as described in claim 1 to 3 and 11.

14. A process for preparing the compounds as claimed in one or more of claims 1 to 10 by reacting the compounds of the formula (4), (4a) or (4b) as claimed in one or more of claims 11 to 13 with metal alkoxides of the formula (5), with metal ketoketonates of the formula (6) or mono- or polycyclic metal halides of the formula (7), (8) and (9)



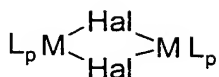
Formula (5)



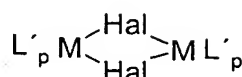
Formula (6)



Formula (7)



Formula (8)



Formula (9)

where the symbols M and R<sup>1</sup> are each as defined under claim 1 to 3, p = 1 or 2 and Hal = F, Cl, Br or I.

15. A process for preparing the compounds of the formula (4), (4a) or (4b) as claimed in one or more of claims 11 to 13 as claimed in one or more of claims 1 to 10 with iridium compounds which bear both alkoxide and/or halide and/or hydroxyl and ketoketonate radicals.

16. A compound as claimed in one or more of claims 1 to 13, characterized in that its purity (determined by means of <sup>1</sup>H NMR and/or HPLC) is more than 99%.

17. A conjugated, part-conjugated or nonconjugated polymer or dendrimer containing one or more of the compounds as claimed in one or more of claims 1 to 10.

18. A polymer or dendrimer as claimed in claim 17, characterized in that at least one R defined in claim 2 is a bond to the polymer or dendrimer.

19. A polymer as claimed in claim 17 and/or 18, characterized in that the polymer is selected from the group of polyfluorenes, polyspirobifluorenes, polyparaphenylenes, polycarbazoles, polyvinylcarbazoles, polythiophenes, polyketones or else from copolymers which have a plurality of the units mentioned here.

20. The use of a compound as claimed in one or more of claims 1 to 10 and/or 16 to 19 in electronic components.

5 21. An electronic component comprising at least one compound as claimed in one or more of claims 1 to 10 and/or 16 to 19.

10 22. The electronic component as claimed in claim 21, characterized in that it is an organic light-emitting diode (OLED), an organic integrated circuit (O-IC), an organic field-effect transistor (O-FET), an organic thin-film transistor (O-TFT), an organic solar cell (O-SC) or an organic laser diode (O-laser).